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ABSTRACT

Designed for instructors or students who will be instructors in health-related occupations, this manual provides basic instruction in writing behavioral objectives. While there is no table of contents, a list of nine objectives on page 4 is a guide to the manual's contents. The objectives state that upon completion of the manual the reader should be able to state the value(s) of using well-defined objectives; differentiate between "teacher-centered" and "learner-centered" objectives; identify the three commonly accepted components of objectives; describe selected formats for stating objectives in a given situation; categorize cognitive behaviors into knowledge, application, and problem-solving levels; identify affective behaviors; identify behaviors which require psychomotor skills; write educational objectives in behavioral terms; and describe how objectives are used in educational programs. The manual contains pre- and post-assessments, questions, and other written exercises the user is expected to complete. A reference list and verb lists for writing educational objectives in the cognitive, psychomotor, and affective domains are included. (LMS)

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WRITING OBJECTIVES FOR HEALTH RELATED INSTRUCTION

A
SELF-INSTRUCTIONAL MANUAL

BONNIE L. LYNCH

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WRITING OBJECTIVES FOR HEALTH RELATED INSTRUCTION

The manual provides basic instruction in the concept of behavioral objectives. It was originally designed to use as pre-workshop study and should not be expected to provide a comprehensive study of objectives.

DIRECTIONS

To assist in a self-evaluation of what you have learned from this manual, pre-assessment and post-assessment forms have been included. Be sure to complete the pre-assessment rating scale before looking at the manual. Complete the post-assessment soon after working through the manual.

From time to time you will be asked to evaluate your progress by answering a question or applying what you have learned. These check points will be indicated by a broken line across the page:

Space is provided for you to write in your answers and information will be provided on the next page which will enable you to check yourself. Be sure to answer the question before continuing. Do not look ahead in the material. If you find you have made a mistake, review the material preceding the question and try again.

Are you ready? Get set. GO!

PRE-ASSESMENT

Before beginning the manual, please complete this rating scale. Estimate your ability to do what is specified. Rate yourself from 1 (low competence) to 5 (high competence).

	COMPETENCE Low				High	
State the values of using well-defined objectives.	1	2	3	4	5	___
Differentiate between "teacher-centered" and "learner-centered" objectives.	1	2	3	4	5	___
Identify the three commonly accepted components of objectives.	1	2	3	4	5	___
Describe selected formats for stating objectives in a given situation.	1	2	3	4	5	___
Categorize cognitive behaviors into knowledge, application, and problem-solving levels.	1	2	3	4	5	___
Identify affective behaviors.	1	2	3	4	5	___
Identify behaviors which require psychomotor skills.	1	2	3	4	5	___
Write educational objectives in behavioral terms.	1	2	3	4	5	___

TOTAL SCORE ___

How did you do? If you had a score of 40, you don't even need this manual! Go have a cup of coffee instead. If somewhat less than that, proceed to the next page to find out WHY you need to be able to do these things.

RATIONALE

Most health specialists who find themselves in instructional positions have had very little exposure to educational principles. Clearly stated objectives are a must, for "if you don't know where you are going, you are liable to end up someplace else." (4,13) Learning is much easier if students know exactly what is expected of them. Accurate descriptions of expected behaviors facilitate program planning and provide a definite "measuring stick" to determine if goals have been met. The statement of educational objectives in behavioral terms causes the focus of instruction to be place where it belongs--on the student.

There are many ways of stating objectives. Authorities do not agree on the best "format" to use. However, it is generally recognized that the statement of objectives must denote measurable attributes which are observable. For example,

> "to teach the students to perform a hemoglobin determination"

may tell what the teacher should do, but it is neither measurable nor observable in the student, whereas,

> "given the proper equipment, the student will perform a cyanmethemoglobin determination on a control sample with results which lie within ± 2 standard deviations of the established value"

tells exactly what the student should be able to do (perform a determination), under what conditions (given the proper equipment--you may also wish to impose a time limit), and to what degree of accuracy (within ± 2 S.D.) Such an objective also gives a guide as to how to go about teaching this competency and what sort of test will determine if the objective has been met.

Stating objectives so precisely may not always be necessary. In some cases, something like

> The student will perform a cyanmethemoglobin determination with accuracy and precision

is usable and easier to get down on paper. The point is: Don't get so hung up on degrees of accuracy and exact conditions that you don't get any objectives written at all. Write your general objectives first and think about the specifics later. What IS important is

- to communicate clearly and effectively just what is to be achieved.

This is particularly essential for health careers educators who are involved in helping students learn spedific skills and attitudes necessary

to the provision of quality patient care. There should be no doubt whatsoever as to what students should be able to do at the completion of the course of study.

- If the students are made aware of these expectations from the beginning, learning is more rapid and thorough and they can evaluate their own progress.

Instructor time, which is usually at a premium, can be saved. If each learner is provided with a well-prepared set of objectives, the instructor's role may be greatly altered. In fact, with some students, there may be little else for the instructor to do. Such a set of objectives also provides a valuable guide for a colleague who may be asked to take over in case of an unexpected absence, thus avoiding undesirable interuptions in the sequence of instruction.

OBJECTIVES OF THE MANUAL

Even for the study of objectives, the use of objectives is appropriate. So that you will know exactly what you are to accomplish, read these objectives now.

GENERAL OBJECTIVE

Following completion of this manual, the learner will be able to prepare behaviorally stated objectives, giving particular attention to the manner in which they are stated and the inclusion of selected domains and levels of behavior.

ENABLING OBJECTIVES (SPECIFIC BEHAVIORS)

1. State the value(s) of using well-defined objectives.
2. Differentiate between "teacher-centered" and "learner-centered" objectives.
3. Identify the three commonly accepted components of objectives.
4. Describe selected formats for stating objectives in a given situation.
5. Categorize cognitive behaviors into knowledge, application, and problem solving levels.
6. Identify affective behaviors.
7. Identify behaviors which require psychomotor skills.
8. Write educational objectives in behavioral terms.
9. Describe how objectives are used in educational programs.

LEARNING TO STATE OBJECTIVES

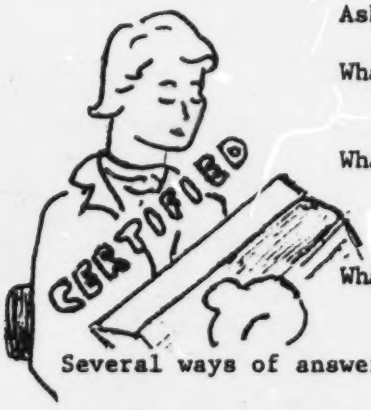
WHAT IS AN OBJECTIVE?

Learning is a process which brings about a change in behavior. An educational objective is a statement of the behavior which the student will be able to exhibit following a learning experience.

WHERE DO YOU START WITH OBJECTIVES?

You may have thought, "at the beginning, of course! " But many times students are not aware of the objectives for a course until they see the final exam.

So let's really start at the beginning, by identifying needed competencies. How must the student be able to perform when he is no longer a student? What must he be able to do to earn your stamp of approval?



Ask yourself:

What does the student need to know?
COGNITIVE BEHAVIOR

What attitudes, values, and feelings whould this helath professional possess?
AFFECTIVE BEHAVIOR

What motor skills must he possess?
PSYCHOMOTOR BEHAVIOR

Several ways of answering these questions are to:

Ask competent practitioners. (As well as drawing on your own experience.)

Actually observe a person who is employed performing the type of work being analyzed.

Interview supervisors (What do you expect this person to do?

Suppose you discover that medical technologists are no longer called upon to do Folin-Wu blood sugars, or that dental hygienists are never required to mix amalgam with a mortar and pestle. Perhaps we should not include these activities in the objectives of our programs even though they were an important part of our own preparation. On the other hand, we may find that the health professional is being required to do things for which he has had no preparation. (Effective patient management and human relations skills are often neglected in technical programs.) Should we not include such skills in our objectives?

Question I. How would you decide what should be included in a set of educational objectives?

DO NOT PROCEED UNTIL YOU HAVE WRITTEN THE ANSWER TO THE QUESTION.

SUCH PERIODIC ACTIVITY ENHANCES RETENTION OF THE MATERIAL , AIDS IN UNDERSTANDING (AND KEEPS YOU FROM GOING TO SLEEP!)

Answer I.

If you said something like, "by determining what the health professional actually does," you're on the right track.

(Sometimes this is referred to as a job, task, or occupational analysis.)

Now, suppose from our analysis of the occupation we have decided that one of the functions of a medical technologist is to draw blood samples, and to do so one must know such things as sterile technique, what anticoagulant to use (if any), and how to go about finding a vein.

Question II. All of these would be classified as what kind of behavior? (Check one)

Cognitive?_____, Affective?_____, or

Psychomotor?_____

But the medical technologist not only needs to know how to find the vein, he must actually find it and draw the blood.

Question III. Finding the vein and drawing the blood involves manual skill and so is classified as what kind of behavior?

_____

You are also concerned that the student will use all possible precautionary measures to assure that the specimen is properly identified, is pleasant, puts the patient at ease and shows concern for the patient's physical and mental well-being.

Question IV. How would you classify these behaviors?

_____.

Hint: Attitudes toward importance of accuracy and patient comfort are involved here.

Answer II. You are right if you remembered that knowledge is classified as <u>cognitive</u> behavior.

Answer III. You probably said <u>psychomotor</u>, and if so, you're right again.

Answer IV. Concern for the patient's well-being and recognition of the need for accuracy are <u>affective</u> behaviors.

As you can see, one objective can have components of all three domains, particularly when it is a performance objective involving a procedure for patient care or a laboratory test.

A student may know <u>how</u> to do something correctly (knowledge) and be <u>able</u> to do it correctly (psychomotor skill), but if he does not possess the proper attitudes he may not actually do it correctly.

- Affective behaviors are extremely important in preparing health professionals.

They are too important to hope they will be acquired by some form of osmosis, although observation and role modeling is one way students learn proper attitudes.

- Affective behaviors which are desirable or necessary in the practitioner must be specified and communicated to the students.

Activities and experiences must be planned to allow the student to practice these behaviors.

Psychomotor skills are easier to define, for there is some sort of overt behavior that is readily observable.

Cognitive behavior is probably the easiest to identify, and this is the type usually measured in pencil and paper tests.

Attitudes are hard to see. You must decide on some observable action that you will take as evidence that a student possesses the desired attitude. For instance, what would a student have to do in order for you to say he exhibited a sense of responsibility toward the patient?

WHAT IS A LEARNER-CENTERED OBJECTIVE?

An objective should be stated in measurable terms and indicate what the student, or learner, should be able to do upon completing the learning experience.

"To provide an atmosphere in which the student can develop the skills necessary to become a competetent professional" is NOT a learner-centered objective. It is a very general and vague institutional goal, but often masquerades as an objective in many brochures and catalogs.

Question VI. Examine these two objectives.

1. Make sure the student knows how to draw blood properly. This will be accomplished by demostration and supervised practice.

2. Using accepted sterile techniques, collect blood samples suitable for various laboratory tests. This shall be done with no more than two attempts on any patient, and with a minimum of mental and physical discomfort to the patient.

WHICH OF THESE IS A LEARNER-CENTERED RATHER THAN A TEACHER-CENTERED OBJECTIVE?

_____

Question VII. How would you rewrite this objective in learner-centered form?

"To increase the student's command of medical terms."

_____

_____

_____

_____

_____

_____

Answer VI. If you chose Number 2, you are correct. A learner-centered objective specifies the behavior of the learner upon completion of the learning experience, rather than what the teacher plans to do to accomplish the desired outcome. Learner-centered objectives focus on the learner and the type of performance expected.

Answer VII. Since you are concerned with the learner's behavior, you should have said something like:

"The student will use correctly the technical terms needed to communicate effectively with other health service personnel."

This defines what you mean by command of medical terms and indicates what the student is expected to do. To be more precise, you may wish to specify the above as a GENERAL objective and then write sub-objectives which identify more specific competencies such as to spell or to define the medical terms.

WHAT IS THE HIERARCHICAL APPROACH TO OBJECTIVES?

A general objective may be used as a framework within which more specific objectives are sub-units. The more specific objectives (sometimes called enabling objectives) may define how the student will demonstrate understanding of or accomplish the more general objective. This is known as a hierarchical format. For example:

General objective--

The student will be able to recognize the principles of hematopoiesis.

Enabling objectives--

The student will

list the stages of maturation (in order) of the various cellular elements.

write an accurate description of each stage of maturation.

list the factors influencing the development of the cellular elements and tell how they influence blood formation.

(and whatever else the instructor decides the student needs to do in order to demonstrate that he recognizes or understands the principles of hematopoiesis.)

Enabling objectives may be further subdivided to the level of specificity desired. This hierarchy should flow smoothly from the most general program goals to the most specific task. One asks "how will the student demonstrate this?" when moving from general to specific and "why whould the student do this?" when moving from the specific to the general. Thus, in order to demonstrate that he can perform as a competent practitioner , the student must demonstrate certain knowledge, perform certain procedures and indicate certain attitudes. If you ask why he should be able to do a certain task, it is so that he can do the procedure in which that task is involved, and thus (along with many other behaviors) show that he can perform as a competent practitioner.

HOW DO YOU WRITE AN OBJECTIVE IN "FULL-BEHAVIORAL" TERMS?

In the design of instructional systems, many educators have come to depend largely on the Magerian approach to the specification of objectives. According to Mager (3), in order to describe terminal behavior, you must:

1. State the observable behavior.
2. Specify the important conditions under which the behavior is to occur (givens and restrictions).
3. Cite the criteria of acceptable performance.

According to this format, when you write educational objectives, you must specify:

1. What, using action verbs that denote observable action.
2. Under what circumstances; what resources may the student use?
3. How well; what accuracy is expected? is speed essential?

We will designate objectives of this type as being stated in full-behavioral terms.

Question VIII. Examine this objective:

"The student will list the stages of maturation of the various elements."

Which, if any, of the three essentials cited above are missing from this objective?

_____

_____

Answer VIII. The conditions or circumstances (2) under which the student is to perform this task are not specified, nor is the degree of accuracy (3). If the instructor felt this was appropriate, the objective might be modified to read:

"From memory, the student will list the maturation stages of all cellular elements, with no more than one error for each cell series."

WHAT OTHER FORMATS ARE APPROPRIATE?

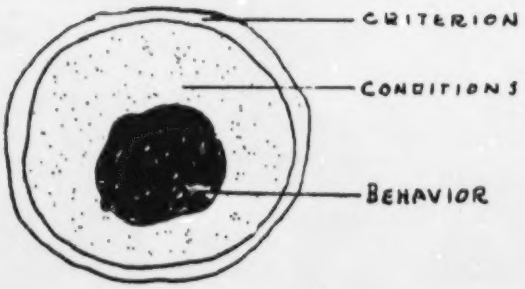
Although many educational "experts" would not agree, we believe it is not necessary or practical to write all objectives in full-behavioral terms, particularly those in the cognitive area, where you have already said that a student must know a certain percentage of the material (70% seems to be common). Some instructors are now specifying certain "essential" objectives by marking them with an asterisk. These are certain things that the instructors feel <u>everyone</u> should know in order to pass the course. Regardless of the total per cent of questions a student answers correctly, if he misses any of the questions relating to the essential objectives, he must be retested.

In performance objectives, conditions are often implied. One would assume that if a student were required to perform a test, he would be given the proper equipment and reagents, unless "select the proper equipment" were part of the objective. Level of performance may be <u>very</u> important here, however,and quality control limits are an excellent guide for performance criteria. If time is important it should also be specified. This may vary with the level of student, who could not be expected to complete a task as quickly the first time he tried it as when he was ready to graduate. Most objectives are written in "terminal" terms, or what the student should be able to do at the <u>completion</u> of the program.

If you expect the student to complete a task from memory or without the aid of reference material, this should be specified. For cognitive material, this can be stated once at the beginning of the set of objectives and not repeated in each objective.

It is probably best to specify the desired behavior first, then ask yourself if there is an important performance criterion, and if you will impose any restrictions upon this performance. If so, include them in your statement, so the student will know what to expect.

The most important part of an objective is the observable behavior--this is the nucleus, without which the objective is not viable. The conditions may be compared to the cytoplasm surrounding the nucleus, and the criterion of performance the limiting membrane.



Question IX. When developing objectives in the hierarchical format, one moves from more general objectives to specific or enabling sub-objectives by asking (1) _____, and from specific to general by asking (2) _____.

Question X. The three parts of a full-behavioral objective are

1. _____

2. _____

3. _____

Question XI. A good source of performance criteria is

_____.

Answer IX. If you answered how ? for (1) and why? for (2), you have already developed a nodding acquaintance with the hierarchical format. Practice in using this format will put this relationship on more familiar terms.

Answer X. 1. an observable behavior ***

2. conditions (givens, restrictions)

3. criteria of acceptable performance

*** essential

Answer XI. A good source of performance criteria is quality control limits or performance standards outlined in procedure manuals.

WHAT VERBS ARE APPROPRIATE?

The choice of verbs is important when specifying behavior, as some may be open to misinterpretation.

Words open to many interpretations	Words open to fewer interpretations**
know	write
appreciate	identify
understand	recite
really understand	differentiate
grasp the significance of	solve
enjoy	construct
believe	list (3,11)

** see also appended lists of verbs

Perhaps one of your objectives, if you are a clinical chemistry instructor, has been:

> The student will understand the basic operation of the Auto-Analyzer.

How would you measure whether a student "understood" the operation of the Auto-Analyzer? Would you want him to: (1) explain the operation in his own words; (2) recite a paragraph from White's Practical Automation in the Clinical Laboratory; (3) take the instrument apart and put it back together again; (4) draw and label a model; (5) detect and correct minor malfunctions; or (6) some combination of the preceding?

HOW WELL CAN YOU WRITE OBJECTIVES?

Knowing what to do is only one part of this activity. To be useful, knowledge must be applied. The real payoff is in the doing---

So, let's do.

Question XII. Choose some particular task or essential knowledge in your own area of work, select an appropriate action verb, and write a learner-centered objective, in full-behavioral terms.

Answer XII. Does your objective clearly state:

the behavior desired?

the conditions under which the behavior will occur?

the criteria of acceptable performance (level of achievement?

If you can answer yes to all of these, you're doing great.

If you had trouble writing your objective, perhaps you should review the previous material, and try again. Be sure to:

1. Identify the terminal behavior. (State what the learner will be doing, using an appropriate action verb. Consult the lists in the appendix if you have trouble thinking of a verb.)

2. Further define the terminal behavior. (Describe what conditions you will impose. May the learner use reference material? From memory? What tools or instruments may he use?)

3. State the criteria of acceptable performance. (100% accuracy? Within ± 2 S.D.? 8 out of 10? Within 10 minutes? Without producing a hematoma?)

Question XIII. Try writing an objective by stages:

The learner will:_____

_____

The learner may use (or must function under these conditions):

_____

_____

Successful achievement will be judged by:

_____

_____

Answer XIII. Check your own progress by answering these questions.

1. Do your objectives clearly define what the student should be able to do at the completion of the learning experience?

2. Would they help identify course content?

3. Do they suggest a test question or practical exam exercise?

If you could answer yes to each question, you're on your way!

As a further check, try submitting sample objectives to a colleague or student to check for clarity.

WHAT TYPES OF OBJECTIVES HAVE YOU WRITTEN?

After you have written the objectives, you may wish to classify them according to the type of behavior which they describe.

Need some help?

Take a look at these examples:

- Cognitive--

  Recall of information: "The student will be able to list the stages of maturation of the cellular elements."

  Interpretation of information:"Given the values of the red cell indices, the student will state whether or not these indices agree with the appearance of the cells on the smear."

  Problem solving: "Given a set of blood values which do not agree with the appearance of the cells on the smear, the student will determine what steps to take before reporting the final results."

According to Bloom's Taxonomy of Educational Objectives, cognitive behavior may be divided into six levels.

I. Knowledge (recall of information)
II. Comprehension
III. Application
IV. Analysis
V. Synthesis
VI. Evaluation

Each of the higher levels requires elements of those lower on the scale. Thus, in order to apply knowledge, you must also recall it and understand (comprehend) it. In order to evaluate something,

you must also analyze it, and synthesize the elements of the analysis. This requires the recall of certain information, the comprehension of this information and the application of it to the problem at hand.

An objective is classified at the highest level involved, even if there are elements of the lower levels included.

Some educators use a condensed and revised taxonomy with three, more easily definable levels specified as:

I. Knowledge (recall)	(Bloom's level I)
II. Application or interpretation	(Bloom's levels II & III)
III. Problem solving	(Bloom's levels IV, V, & VI)

- Affective (Attitudes, Values, Beliefs)

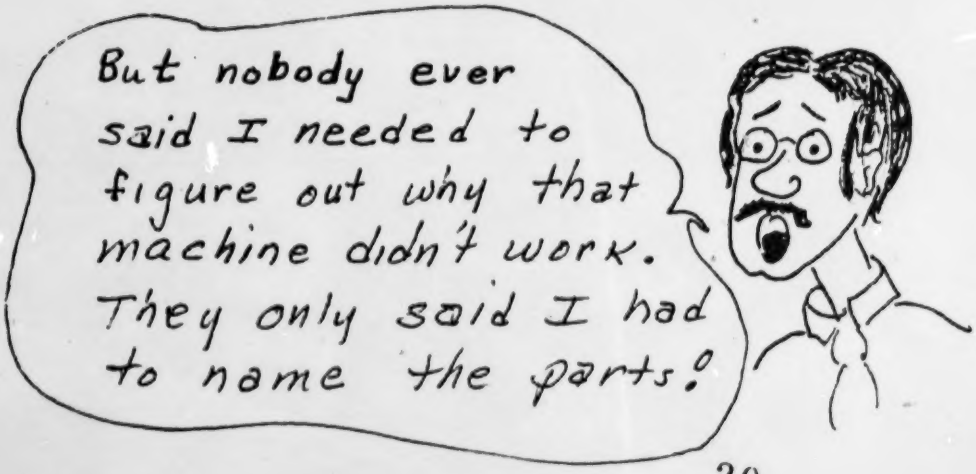
  " The student will readlily admit mistakes, and take immediate steps to correct them."

- Psychomotor (manual skills)

  " Given the proper equipment, the student will perform effective dental floss and toothbrushing techniques to reduce his plaque score to 1.0 or below."

In order to maximize transfer of training to new situations, students must be given practice in application, interpretation, and problem solving techniques, as well as merely being required to recall information. In examining many objectives for real and simulated educational programs we find that almost all of them are knowledge (Level I) and psychomotor objectives.

- Be sure to give consideration to the need to include the higher level cognitive objectives and affective objectives.



Question XIV.
See if you can apply what you have just learned by classifying the following objectives according to whether they are Cognitive (Level I, II, or III), Affective, or Psychomotor.

_____1. Demonstrate willingness to keep up with continuous changes in the field of nursing by voluntary study and self evaluation.

_____2. Perform phlebotomy and provide post-phlebotomy care.

_____3. Select appropriate surgical trays.

_____4. Follow generally recommended precautions in the use of equipment.

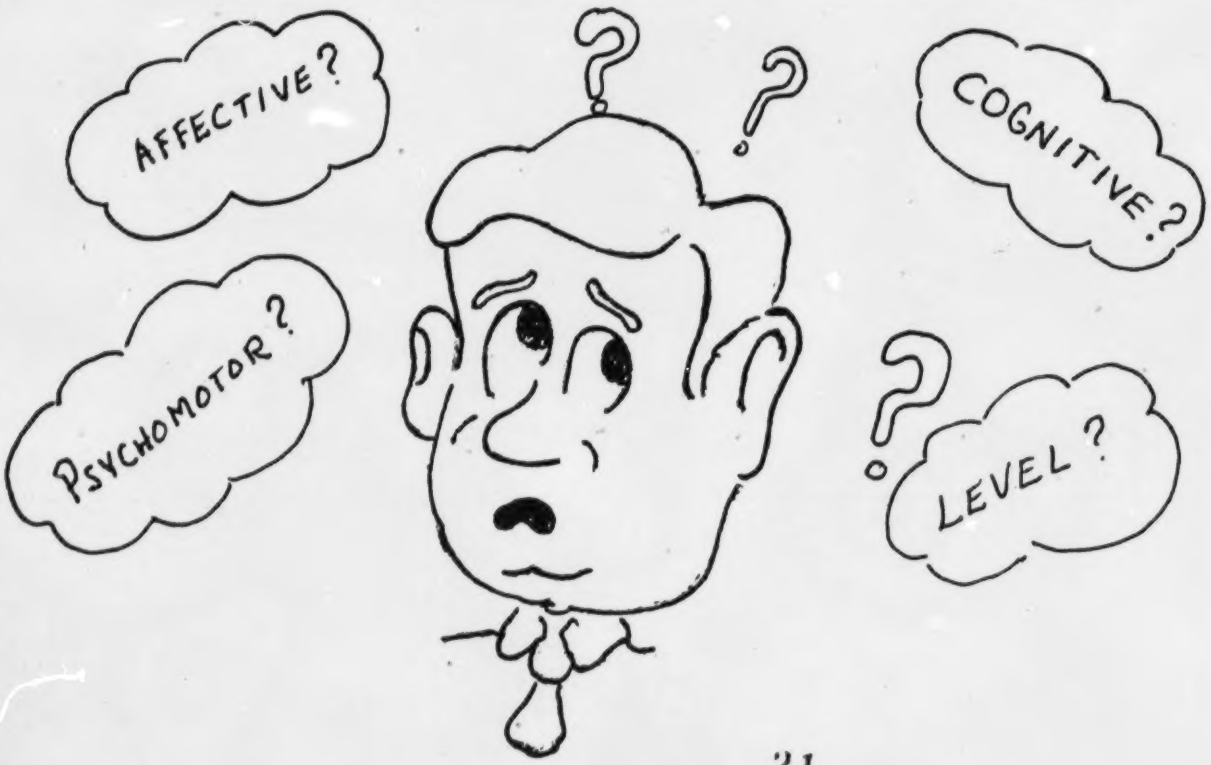
_____5. State procedures for routine X-rays of the extremities.

_____6. Identify an unknown gram-negative bacillus through selection and use of appropriate media and tests.

_____7. Prepare readable blood smears.

_____8. List the reasons why joint range of motion needs to be measured.

_____9. Plan a method of control for a current health problem.



Answer XIV. Your answers should look like this:

1. Affective
2. Psychomotor (also has cognitive component)
3. Cognitive Level II
4. Affective
5. Cognitive Level I
6. Cognitive Level III
7. Psychomotor
8. Cognitive Level I
9. Cognitive Level III

HOW DO WE USE OBJECTIVES?

Now that you have gone to all the trouble of learning to write and identify objectives, how can you use them effectively? You have learned that objectives specify the behavior which the learner should exhibit upon completion of an educational experience. (What he should be able to do!)

- Objectives can serve to guide the behavior of the teacher and the learner.

They guide the teacher in identifying and ordering course content, planning learning activities, and developing evaluation instruments (tests), whether they be practical or written. They provide the student with a guide to use in organizing learning activities and as a study guide. They should answer the often-asked questions "What will the test cover?" or "Just what <u>is</u> my job?" Objectives are guidelines for answering:

Where am I going?
How will I get there?
How will I know I've arrived? (4)

To present the students with a list of objectives at the beginning of the course is not enough. They should be discussed to check for clarity, and referred to often in the course of instruction, e.g. "The material in this lecture should enable you to reach the following objectives:....." or "At the end of the first week of this rotation, you should have completed Objectives 1.0 and 2.0."

To check your knowledge regarding the use of objectives, see if you can answer the questions on the next page.

Question XV. Of what value are clearly stated objectives?

Question XVI. How are objectives used?

Answer XV. Objectives help guide the behavior of the teacher and the learner. They identify course content and guide the preparation of evaluation instruments. Your answer may also reflect some of the material presented in the RATIONALE on pages 3 and 4.

Answer XVI. Your answer should reflect your comprehension of the material presented on page 19.

SUMMARY

On the next two pages you will find a set of objectives for developing and using program objectives. These are written in the hierarchical format. You have been dealing with only one objective at a time in this package. This set of objectives will give you a better idea of the "total picture" and of how all the trees go to make up the forest.

Hopefully, you are better prepared to develop and use educational objectives because of your experience with this manual. It would be unrealistic to expect that you would become truly skillful in preparing and using objectives because of working through one short self-instructional package. To develop proficiency, you must gain experience in writing and using educational objectives, but perhaps you are at least beginning to find the right path through the forest!

For further information, you may wish to consult one of the references on page 24.

CLOSURE

At this point it is suggested that you refer to the objectives for this manual (page 4). Can you do all these things? If you question your ability in any area, go back through the appropriate parts of the manual.

Now, complete the post-assessment; add up you total score; and see if you feel a change has occurred in your behavior regarding educational objectives.

CONGRATULATIONS! Have a glass of champagne to celebrate your success.

DEVELOPING PROGRAM OBJECTIVES

These objectives, written in the hierarchical format, outline the process involved in developing program objectives. Each "sub-objective" is a step in reaching the more general objective under which it is listed. These "objectives" are analagous to a content outline for a course in "How to Write Objectives". The only difference between this and a course outline is that these are written in terms of expected observable behaviors.

This format may be used as a model for developing program and/or course objectives. Organization of material should be compatible with the type of program. That is, all practical skills (psychomotor) objectives may be grouped together for one course and listed separately from the theoretical instruction. This is particularly appropriate where didactic and clinical are separated. In a situation (such as student lab) where practical experience in each topic immediately follows instruction in theory, organization of objectives should probably follow topic headings.

OBJECTIVES FOR OBJECTIVES

1.0 When confronted with the responsibility, the faculty will write objectives. They will:

- 1.1 Identify important student behaviors which are compatible with institutional goals and the role the student is expected to fill.
  - 1.1.1 Describe essential knowledge, interpretation, and problem solving abilities.
  - 1.1.2 Specify skills.
  - 1.1.3 Identify desired attitudes.
- 1.2 Select action verbs which describe the behaviors expected of the student at the completion of the instruction.
  - 1.2.1 Select verbs which denote an observable behavior.
  - 1.2.2 Select verbs which are appropriate to the cognitive level desired.
- 1.3 Describe important conditions under which the desired behaviors must occur.
  - 1.3.1 State when, if appropriate.
  - 1.3.2 Describe resources allowed or if this should be from memory.
- 1.4 Where appropriate, describe standards of performance required for the behavior.
  - 1.4.1 State howwell the activity must be performed.

1.4.1.1 To what degree of accuracy or upon whose personal judgment.

1.4.1.2 What percentage of correctness.

1.4.1.3 In order that what consequences will or will not follow.

1.4.1.4 If cited, state where external standards are specified. (eg. AABB manual)

1.4.2 If important, describe time constraints.

1.5 Arrange 1.2, 1.3, and 1.4 (if appropriate) in a concise statement which clearly communicates to the student the instructional intent, in terms of what he (the student) will be able to do at the conclusion of the instruction.

1.6 Group and number objectives in a format appropriate to the situation.

2.0 The faculty will use these objectives effectively. They will

2.1 Communicate them to the students

2.1.1 Discuss with the student to check for clarity

2.1.2 Refer to objectives when presenting learning activities

2.2 Use objectives in planning learning experiences which will best facilitate the attainment of the desired behaviors.

2.3 Use objectives as a guide when constructing evaluation instruments.

2.4 Revise objectives periodically to reflect new developments and educational goals.

Sub-objectives (or enabling objectives) describe the activities which must be performed in order to reach the more general objective under which the sub-objectives are listed.

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3. Mager, Robert F.: Preparing Instructional Objectives., Fearon Publishers, Palo Alto, CA, 1962

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APPENDIX

VERB LIST FOR WRITING EDUCATIONAL OBJECTIVES--COGNITIVE DOMAIN

Knowledge (recall)

cite	recite
count	recognize
define	record
draw	relate
identify	repeat
indicate	select
list	state
name	tabulate
point	tell
quote	trace
read	write

Comprehension

associate	express
classify	extrapolate
compare	interpolate
compute	interpret
contrast	locate
describe	predict
differentiate	report
discuss	restate
distinguish	review
estimate	translate
explain	

Application

apply	practice
calculate	predict
complete	relate
demonstrate	report
dramatize	restate
employ	review
examine	schedule
illustrate	sketch
interpolate	solve
interpret	translate
locate	use
operate	utilize
order	

Analysis

analyze	distinguish
appraise	experiment
contrast	infer
criticize	inspect
debate	inventory
detect	question
diagram	separate
differentiate	summarize

Synthesis

arrange	integrate
assemble	manage
collect	organize
compose	plan
construct	prepare
create	prescribe
design	produce
detect	propose
formulate	specify
generalize	synthesize

Evaluation

appraise	measure
assess	rank
choose	rate
critique	recommend
determine	revise
estimate	score
evaluate	select
grade	test
judge	

VERB LIST FOR WRITING EDUCATIONAL OBJECTIVES--PSYCHOMOTOR DOMAIN

add	expel	obtain	select
adjust	filter	operate	set up
agitate	guide	perform	shake
aspirate	handle	pick(colony)	smear
build	inject	pipet	smell
calibrate	inoculate	place	stain
cleanse	invert	plot	start
collect	label	pour	stop
combine	lyse	prepare	stopper
construct	maintain	prick	streak
demonstrate	make	puncture	tilt
dilute	manipulate	record	titrate
dispose	mark	remove	transfer
drain	measure	rinse	use
draw	mix	scrape	wash
emulsify	mount	seal	wipe

VERB LIST FOR WRITING EDUCATIONAL OBJECTIVES--AFFECTIVE DOMAIN

accepts	investigates	recommends
adopts	joins	rejects
advocates	keeps(preserves)	seeks
annotates	obeys	selects
asks	objects	shares
attempts	offers	sleeps
attends	organizes	specifies
challenges	participates	submits
chooses	perseveres	subscribes
consults	persists	suggests
criticizes	praises	supports
defends	promotes	tests
delays	proposes	tries
designs	qualifies	visits
disputes	queries	volunteers
evaluates	questions	weighs (judges)
initiates	reads	yawns

POST-ASSESSMENT

After completing the manual, please estimate your ability to do what is specified, as you did with the pre-assessment form. Do not look at the pre-assessment while you are doing the post-assessment.
Rate yourself from 1 (low competence) to 5 (high competence).

	COMPETENCE					
	Low				High	
State the value of using well-defined objectives.	1	2	3	4	5	____
Differentiate between "teacher-centered" and "learner-centered" objectives.	]	2	3	4	5	____
Identify the three commonly accepted components of objectives.	]	2	3	4	5	____
Describe selected formats for stating objectives in a given situation.	1	2	3	4	5	____
Categorize cognitive behaviors into knowledge, application, and problem solving levels.	1	2	3	4	5	____
Identify affective behaviors.	1	2	3	4	5	____
Identify behaviors which require psychomotor skills.	1	2	3	4	5	____
Write educational objectives in behavioral terms.	1	2	3	4	5	____

Total Score ____